



SEQUENCE LISTING

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TECH CENTER 1600/2800

<110> Cahoon, Rebecca E.
Klein, Theodore M.
Odell, Joan T.
Orozco, Emil M. Jr.

<120> PLANT CELL CYCLIN GENES

<130> BB1149 US NA

<150> 60/078,735

<151> 1998 March 20

<150> PCT/US99/06047

<151> 1999 March 19

<160> 32

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<210> 1

<211> 1071

<212> DNA

<213> Zea mays

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<213> Zea mays

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Leu Arg Ser Leu Glu Val Asp Pro Gln Arg Arg Ser Arg Ser Asp Tyr
35 40 45
Ile Glu Ala Val Gln Ala Asp Val Thr Ala His Met Arg Ser Ile Leu
50 55 60
Val Asp Trp Leu Val Glu Val Ala Glu Glu Tyr Lys Leu Val Ala Asp
65 70 75 80

Thr Leu Tyr Leu Thr Ile Ser Tyr Val Asp Arg Phe Leu Ser Val Asn
 85 90 95
 Ala Leu Gly Arg Asp Lys Leu Gln Leu Leu Gly Val Ala Ser Met Leu
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 Ile Ala Ala Lys Phe Glu Glu Ile Ser Pro Pro His Pro Glu Asp Phe
 115 120 125
 Cys Tyr Ile Thr Asp Asn Thr Tyr Thr Lys Glu Glu Leu Leu Lys Met
 130 135 140
 Glu Ser Asp Ile Leu Lys Leu Leu Lys Phe Glu Leu Gly Asn Pro Thr
 145 150 155 160
 Ile Lys Thr Phe Leu Arg Arg Phe Ile Arg Ser Ala His Glu Asp Lys
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 Lys Gly Ser Ile Leu Leu Met Glu Phe Leu Gly Ser Tyr Leu Ala Glu
 180 185 190
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~~195 200 205~~
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 210 215 220
 Asn Pro Trp Asn Thr Lys Leu Gln Lys Met Thr Gly Tyr Lys Val Ser
 225 230 235 240
 Glu Leu Lys Asp Cys Ile Val Ala Ile His Asp Leu Gln Leu Asn Arg
 245 250 255
 Lys Cys Pro Ser Leu Thr Ala Ile Arg Asp Lys Tyr Lys Gln His Lys
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Xaa	Arg	Lys	Glu	Lys	Xaa	Leu	Cys	Xaa	Lys	Asn	Pro	Asn	Glu	Lys	Lys
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Pro	Ser	Pro	Thr	Asn	Asn	Asn	Thr	Phe	Pro	Ser	Pro	Gln	Ile	Xaa	Glu
						70				75					80
Ser	Tyr	Asp	Ser	Asp	Ile	His	Gly	Tyr	Leu	Arg	Glu	Met	Glu	Met	Gln
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 <212> DNA
 <213> Triticum aestivum

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~~aaagataaatg geaatccaca aatgtgtgct tcctatgctg cagagatata cagaaacctt 180~~
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 <212> PRT
 <213> Triticum aestivum

<220>
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 <222> (195)

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 Gly Leu Asn Val Ile Asp Ile Asp Lys Asp Asn Gly Asn Pro Gln Met
 35 40 45
 Cys Ala Ser Tyr Ala Ala Glu Ile Tyr Arg Asn Leu Met Ala Ala Glu
 50 55 60
 Leu Ile Arg Arg Pro Lys Ser Asn Tyr Met Glu Thr Leu Gln Arg Asp
 65 70 75 80
 Ile Thr Lys Gly Met Arg Gly Ile Leu Ile Asp Trp Ala Leu Arg Phe
 85 90 95

Leu Glu Glu Tyr Lys Leu Leu Pro Asp Thr Leu Tyr Leu Thr Val Tyr
 100 105 110
 Leu Ile Asp Gln Phe Leu Ser Arg Lys Tyr Ile Glu Arg Gln Lys Leu
 115 120 125
 Gln Leu Leu Gly Ile Thr Ser Met Leu Ile Ala Ser Lys Tyr Glu Glu
 130 135 140
 Ile Cys Ala Pro Arg Val Glu Glu Phe Cys Phe Ile Thr Asp Asn Thr
 145 150 155 160
 Tyr Thr Lys Asn Gln Val Leu Lys Met Glu Cys Glu Val Leu Asn Asp
 165 170 175
 Leu Gly Phe His Leu Ser Val Pro Thr Ile Lys Thr Phe Leu Arg Arg
 180 185 190
 Phe Leu Xaa Ala Ala His Ala Ser Gln Lys Ser Pro Trp Ala Thr Leu
 195 200 205
 Gly Tyr Leu
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 <212> DNA
 <213> Zea mays

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<212> PRT
<213> Zea mays

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35 40 45

Val Val Asp Gln Asp Glu Glu Tyr Val Ala Leu Leu Leu Ser Lys Glu
50 55 60

Ser Ala Ser Gly Gly Gly Gly Pro Val Glu Glu Met Glu Asp Trp Met
65 70 75 80

~~Lys Ala Ala Arg Ser Gly Cys Val Arg Trp Ile Ile Lys Thr Thr Ala~~
~~85 90 95~~

Met Phe Arg Phe Gly Gly Lys Thr Ala Tyr Val Ala Val Asn Tyr Leu
100 105 110

Asp Arg Phe Leu Ala Gln Arg Arg Val Asn Arg Glu His Ala Trp Gly
115 120 125

Leu Gln Leu Leu Met Val Ala Cys Met Ser Leu Ala Thr Lys Leu Glu
130 135 140

Glu His His Ala Pro Arg Leu Ser Glu Phe Pro Leu Asp Ala Cys Glu
145 150 155 160

Phe Ala Phe Asp Ser Ala Ser Ile Leu Arg Met Glu Leu Leu Val Leu
165 170 175

Gly Thr Leu Glu Trp Arg Met Ile Ala Val Thr Pro Phe Pro Tyr Ile
180 185 190

Ser Tyr Phe Ala Ala Arg Phe Arg Glu Thr Ser Ala Gly Arg Ile Leu
195 200 205

Met Arg Ala Val Glu Cys Val Phe Ala Ala Ile Lys Val Ile Ser Ser
210 215 220

Val Glu Xaa Arg Pro Ser Thr Ile Ala Val Ala Ser Ile Leu
225 230 235

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<213> Oryza sativa

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 <212> PRT
 <213> Oryza sativa

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 Asp Arg Phe Leu Ala Arg Arg Cys Val Asp Arg Asp Lys Glu Trp Ala
 35 40 45
 Leu Gln Leu Leu Ser Val Ala Cys Leu Ser Leu Ala Ala Lys Val Glu
 50 55 60
 Glu Arg Arg Pro Pro Arg Leu Pro Glu Phe Lys Leu Asp Met Tyr Asp
 65 70 75 80
 Cys Ala Ser Leu Met Arg Met Glu Leu Leu Val Leu Thr Thr Leu Lys
 85 90 95
 Trp Gln Met Ile Thr Glu Thr Pro Phe Ser Tyr Leu Asn Cys Phe Thr
 100 105 110
 Ala Lys Phe Arg His Asp Glu Arg Lys Ala Ile Val Leu Arg Ala Ile
 115 120 125
 Glu Cys Ile Phe Ala Ser Ile Lys Val Ile Ser Ser Val Gly Tyr Gln
 130 135 140
 Pro Ser Thr Ile Ala Leu Ala Ala Ile Leu Ile Ala Arg Asn Lys Glu
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 Thr Ala Pro Asn Leu Asp Glu Leu Ser Val His Arg Leu Ala Pro Trp
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 Gln Leu Met Met Leu
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 <212> DNA
 <213> Glycine max

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 35 40 45
 Ser Ile Ala Ser Phe Ile Glu His Glu Arg Asn Phe Val Pro Gly Phe
 50 55 60
 Glu Tyr Leu Ser Arg Phe Gln Ser Arg Ser Leu Asp Ala Asn Ala Arg
 65 70 75 80
 Glu Glu Ser Val Gly Trp Ile Leu Lys Val His Ala Tyr Tyr Gly Phe
 85 90 95
 Gln Pro Leu Thr Ala Tyr Leu Ala Val Asn Tyr Met Asp Arg Phe Leu
 100 105 110
 Asp Ser Arg Arg Leu Pro Glu Thr Asn Gly Trp Pro Leu Gln Leu Val
 115 120 125
 Ser Val Ala Cys Leu Ser Leu Ala Ala Lys Met Glu Glu Pro Leu Val
 130 135 140

Pro Ser Leu Leu Asp Leu Gln Ile Glu Gly Ala Lys Tyr Ile Phe Glu
 145 150 155 160
 Pro Arg Thr Ile Arg Arg Met Glu Leu Leu Val Leu Gly Val Leu Asp
 165 170 175
 Trp Arg Leu Arg Ser Val Thr Pro Leu Cys Phe Leu Ala Phe Phe Ala
 180 185 190
 Cys Lys Val Asp Ser Thr Gly Thr Phe Ile Arg Phe Leu Ile Ser Arg
 195 200 205
 Ala Thr Glu Ile Ile Val Ser Asn Ile Gln Glu Ala Ser Phe Leu Ala
 210 215 220
 Tyr Trp Pro Ser Cys Ile Ala Ala Ala Ala Ile Leu Thr Ala Ala Asn
 225 230 235 240
 Glu Ile Pro Asn Trp Ser Val Val Lys Pro Glu Asn Ala Glu Ser Trp
 245 250 255
 Cys Glu Gly Leu Arg Lys Glu Lys Val Ile Gly Cys Tyr Gln Leu Met
 260 265 270
 Gln Glu Leu Val Ile Asn Asn Asn Gln Arg Lys Leu Pro Leu Leu Lys
 275 280 285
 Val Leu Pro Gln Leu Arg Val Thr Thr Arg Thr Arg Met Arg Ser Ser
 290 295 300
 Thr Val Ser Ser Phe Ser Ser Ser Ser Ser Thr Ser Phe Ser Leu Ser
 305 310 315 320
 Cys Lys Arg Arg Lys Leu Asn Asn Arg Leu Trp Val Asp Asp Lys Gly
 325 330 335

Asn Ser Glu

<210> 13
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 ttccaatacc tcaatagggt ccaatctcgc tctctcgacg cctctgccag agaagaatcc 180
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 ctagtcccat ctcttttgga ccttcaggta gaagggtgcta aatacgtatt tgaacccaaa 420
 acaattagaa gaatggagct acttggtctg ggcgtgttgg attggaggct aagatcggtt 480
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<210> 14
 <211> 318
 <212> PRT
 <213> Glycine max

<400> 14
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 35 40 45

Ser Arg Ser Leu Asp Ala Ser Ala Arg Glu Glu Ser Val Ala Trp Ile
 50 55 60

Leu Lys Val Gln Ala Tyr Tyr Ala Phe Gln Pro Val Thr Ala Tyr Leu
 65 70 75 80

Ser Val Asn Tyr Leu Asp Arg Phe Leu Asn Ser Arg Pro Leu Pro Pro
 85 90 95

Lys Thr Asn Gly Trp Pro Leu Gln Leu Leu Ser Val Ala Cys Leu Ser
 100 105 110

Leu Ala Ala Lys Met Glu Glu Ser Leu Val Pro Ser Leu Leu Asp Leu
 115 120 125

Gln Val Glu Gly Ala Lys Tyr Val Phe Glu Pro Lys Thr Ile Arg Arg
 130 135 140

Met Glu Leu Leu Val Leu Gly Val Leu Asp Trp Arg Leu Arg Ser Val
 145 150 155 160

Thr Pro Phe Ser Phe Leu Asp Phe Phe Ala Cys Lys Leu Asp Ser Thr
 165 170 175

Gly Thr Phe Thr Gly Phe Leu Ile Ser Arg Ala Thr Gln Ile Ile Leu
 180 185 190

Ser Asn Ile Gln Glu Ala Ser Phe Leu Ala Tyr Trp Pro Ser Cys Ile
 195 200 205

Ala Ala Ala Ala Ile Leu His Ala Ala Asn Glu Ile Pro Asn Trp Ser
 210 215 220

Leu Val Arg Pro Glu His Ala Glu Ser Trp Cys Glu Gly Leu Arg Lys
 225 230 235 240

Glu Lys Ile Ile Gly Cys Tyr Gln Leu Met Gln Glu Leu Val Ile Asp
245 250 255

Asn Asn Gln Arg Lys Pro Pro Lys Val Leu Pro Gln Leu Arg Val Thr
260 265 270

Ile Ser Arg Pro Ile Met Arg Ser Ser Val Ser Ser Phe Leu Ala Ser
275 280 285

Ser Ser Ser Pro Ser Ser Ser Ser Leu Ser Cys Arg Arg Arg Lys Leu
290 295 300

Asn Asn Ser Leu Trp Val Asp Asp Asp Lys Gly Asn Ser Gln
305 310 315

<210> 15
<211> 570
<212> DNA
<213> Triticum aestivum

<220>
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<222> (515)..(516)

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gagatttggg ctccagaggt gaacgacttc atattgttct cgcacaacac atatactagg 180
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cccacacctt acgtcttctt cgtgtgattc gccaaaggccg catcctcctg agataagaag 300
aacggcaagg aggtaaaagg aacaccagat tttaacaaat cctcagatgt agtacgtatc 360
tccatttgcc aaacatgata tattgctgaa ttctgttctc cctgggtgat tgtctaaatg 420
gagacacgtc tttttttcgt ggactggcgc tctgtagtat ggacagaata tgtttgattc 480
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<210> 16
<211> 75
<212> PRT
<213> Triticum aestivum

<220>
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<222> (68)

<400> 16
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Lys Tyr Glu Glu Ile Trp Ala Pro Glu Val Asn Asp Phe Ile Leu Phe
20 25 30

Ser Asp Asn Thr Tyr Thr Arg Glu Gln Ile Leu Arg Met Glu Lys Ala
35 40 45

Ile Leu Asn Met Leu Glu Trp Asn Leu Thr Val Pro Thr Pro Tyr Val
50 55 60

Phe Leu Val Xaa Phe Ala Lys Ala Ala Ser Ser
65 70 75

<210> 17
<211> 1932
<212> DNA
<213> Zea mays

<220>
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<222> (8)

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<222> (26)

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<221> unsure
<222> (159)

<400> 17
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<210> 18
<211> 388
<212> PRT
<213> Zea mays

<400> 18
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Glu Glu His Ser Ser Ile Leu Trp Tyr Glu Glu Glu Glu Glu Glu Leu
20 25 30

Glu Ala Val Gly Arg Arg Ser Gly Arg Ser Pro Gly Tyr Gly Asp Asp
 35 40 45
 Phe Gly Ala Asp Leu Phe Pro Pro Gln Ser Glu Glu Cys Val Ala Gly
 50 55 60
 Leu Val Glu Arg Glu Arg Asp His Met Pro Gly Pro Cys Tyr Gly Asp
 65 70 75 80
 Arg Leu Arg Gly Gly Gly Gly Cys Leu Cys Val Arg Arg Glu Ala Val
 85 90 95
 Asp Trp Ile Trp Lys Ala Tyr Thr His His Arg Phe Arg Pro Leu Thr
 100 105 110
 Ala Tyr Leu Ala Val Asn Tyr Leu Asp Arg Phe Leu Ser Leu Ser Glu
 115 120 125
 Val Pro Asp Cys Lys Asp Trp Met Thr Gln Leu Leu Ala Val Ala Cys
 130 135 140
 Val Ser Leu Ala Ala Lys Met Glu Glu Thr Ala Val Pro Gln Cys Leu
 145 150 155 160
 Asp Leu Gln Glu Val Gly Asp Ala Arg Tyr Val Phe Glu Ala Lys Thr
 165 170 175
 Val Gln Arg Met Glu Leu Leu Val Leu Thr Thr Leu Asn Trp Arg Met
 180 185 190
 His Ala Val Thr Pro Phe Ser Tyr Val Asp Tyr Phe Leu Asn Lys Leu
 195 200 205
 Asn Asn Gly Gly Ser Thr Ala Pro Arg Ser Cys Trp Leu Leu Gln Ser
 210 215 220
 Ala Glu Leu Ile Leu Arg Ala Ala Arg Gly Thr Gly Cys Val Gly Phe
 225 230 235 240
 Arg Pro Ser Glu Ile Ala Ala Ala Val Ala Ala Ala Val Ala Gly Asp
 245 250 255
 Val Asp Asp Ala Asp Gly Val Glu Asn Ala Cys Cys Ala His Val Asp
 260 265 270
 Lys Glu Arg Val Leu Arg Cys Gln Glu Ala Ile Gly Ser Met Ala Ser
 275 280 285
 Ser Ala Ala Ile Asp Asp Ala Thr Val Pro Pro Lys Ser Ala Arg Arg
 290 295 300
 Arg Ser Ser Pro Val Pro Val Pro Gln Ser Pro Val Gly Val Leu Asp
 305 310 315 320
 Ala Ala Pro Cys Leu Ser Tyr Arg Ser Glu Glu Ala Ala Thr Ala Thr
 325 330 335
 Ala Thr Ala Thr Ser Ala Ala Ser His Gly Ala Pro Gly Ser Ser Ser
 340 345 350
 Ser Ser Ser Thr Ser Pro Val Thr Ser Lys Arg Arg Lys Leu Ala Ser
 355 360 365
 Arg Cys Asp Gly Ser Cys Ser Asp Arg Ser Lys Arg Ala Pro Ala Gln
 370 375 380

Trp Thr Lys Glu
385

<210> 19
<211> 481
<212> DNA
<213> Oryza sativa

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~~tetecgccgn cgacatccag aggggcgagg agttcatgtt cgacgaggcg aaaatccagc 180~~
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gatgccatca nggcgcgcgc gtcgagctcc tcttccgct ctaagccggg angtgaacna 360
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<210> 20
<211> 110
<212> PRT
<213> Oryza sativa

<220>
<221> UNSURE
<222> (26)

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<222> (100)

<400> 20
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Pro Arg Leu Leu Ala Ile Ser Cys Leu Xaa Leu Ala Ala Lys Met Gln
20 25 30
Arg Ala Ala Ala Ile Ser Ala Xaa Asp Ile Gln Arg Gly Glu Glu Phe
35 40 45
Met Phe Asp Glu Ala Lys Ile Gln Arg Met Glu Gln Met Val Leu Asn
50 55 60
Ala Leu Glu Trp Arg Thr Arg Ser Val Thr Pro Leu Ala Phe Leu Gly
65 70 75 80
Phe Phe Leu Ser Ala Trp Phe Pro Gln Ala Ala Pro Gly Ala Ala
85 90 95

Arg Cys His Xaa Gly Arg Ala Val Glu Leu Leu Leu Arg Val
 100 105 110

<210> 21
 <211> 789
 <212> DNA
 <213> Triticum aestivum

<400> 21
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 aaagtgatgg agcttttgggt cttcagcacc ttgaaatgga ggatgcaagc tgttactgct 180
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 tcagttgtcg aaatggctac aactaattgc aagtatataa acaagggagt gtgatgtgac 420
 aggaaagatc ctgatgaagt gcttccttta tggaatgcct atctgaagt ttggactaaga 480
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 aaggcaagca gttagtcat atcttactac tttgcactat tgtagatgga tgggtgagggga 660
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<210> 22
 <211> 163
 <212> PRT
 <213> Triticum aestivum

<220>
 <221> UNSURE
 <222> (28)

<220>
 <221> UNSURE
 <222> (95)

<220>
 <221> UNSURE
 <222> (138)

<400> 22
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 Pro Ser Ser Asp Leu Thr Ala Ser Thr Lys Met Xaa Phe Glu Ala Asn
 20 25 30
 Ser Ala Phe Glu Ala Arg Thr Ile Lys Val Met Glu Leu Leu Val Phe
 35 40 45
 Ser Thr Leu Lys Trp Arg Met Gln Ala Val Thr Ala Cys Ser Phe Ile
 50 55 60
 Asp Tyr Phe Leu Cys Lys Phe Asn Asp His Asp Thr Pro Ser Met Leu
 65 70 75 80
 Ala Phe Ser Cys Ser Thr Asp Leu Ile Leu Ser Thr Thr Lys Xaa Ala
 85 90 95
 Asp Phe Leu Val Phe Arg His Ser Glu Ile Ala Gly Ser Val Ala Leu
 100 105 110
 Pro Ser Phe Gly Glu His Lys Thr Ser Val Val Glu Met Ala Thr Thr
 115 120 125

Asn Cys Lys Tyr Ile Asn Lys Gly Val Xaa Cys Asp Arg Lys Asp Pro
 130 135 140

Asp Glu Val Leu Pro Leu Trp Asn Ala Tyr Leu Lys Phe Gly Leu Arg
 145 150 155 160

Asp Met Leu

<210> 23
 <211> 603
 <212> DNA
 <213> Zea mays

<220>
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 <222> (441)

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<210> 24
 <211> 318
 <212> PRT
 <213> Zea mays

<400> 24

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			20				25						30		
Arg	Cys	Phe	Leu	Pro	Gly	Gly	Ala	Leu	Arg	Leu	Gly	Asp	Gln	Pro	Trp
		35					40					45			
Met	Ala	Arg	Leu	Ala	Ala	Val	Thr	Cys	Phe	Ala	Leu	Ala	Ala	Lys	Val
	50					55					60				

Glu	Glu	Thr	Arg	Val	Pro	Pro	Leu	Leu	Asp	Leu	Gln	Leu	Tyr	Ala	Ala
65					70					75					80
Ala	Asp	Ala	Ala	Asp	Pro	Tyr	Val	Phe	Glu	Ala	Lys	Thr	Val	Arg	Arg
				85					90					95	
Met	Glu	Leu	Leu	Val	Leu	Ser	Ala	Leu	Gly	Trp	Arg	Met	His	Pro	Val
		100						105					110		
Thr	Pro	Phe	Ser	Tyr	Leu	Gln	Pro	Val	Leu	Ala	Asp	Ala	Ala	Thr	Arg
		115					120					125			
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	130					135					140				
Trp	Pro	Arg	His	Arg	Pro	Ser	Ala	Trp	Ala	Ala	Ala	Ala	Leu	Leu	Ile
145					150					155					160
Thr	Ala	Ala	Ala	Gly	Asp	Gly	Gly	Asp	Gly	Asp	Gly	Asp	Thr	Glu	Leu
				165					170					175	
Leu	Ala	Leu	Ile	Asn	Ala	Pro	Glu	Asp	Lys	Thr	Ala	Glu	Cys	Ala	Lys
		180						185					190		
Ile	Ile	Ser	Glu	Val	Thr	Gly	Met	Ser	Phe	Leu	Ala	Cys	Asp	Val	Gly
		195					200					205			
Val	Ser	Ala	Gly	Asn	Lys	Arg	Lys	His	Ala	Ala	Ala	Gln	Leu	Tyr	Ser
	210					215					220				
Pro	Pro	Pro	Ser	Pro	Ser	Gly	Val	Ile	Gly	Ala	Leu	Ser	Cys	Phe	Ser
225					230					235					240
Cys	Glu	Ser	Ser	Thr	Ser	Ala	Thr	Ala	Met	Ala	Ala	Ala	Val	Gly	Pro
				245					250					255	
Trp	Ala	Pro	Ser	Ala	Ser	Val	Ser	Val	Ser	Ser	Ser	Pro	Glu	Pro	Pro
		260						265					270		
Gly	Arg	Ala	Pro	Lys	Arg	Ala	Ala	Ala	Ala	Ser	Ala	Ser	Ala	Ser	Ala
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Ser Ala Gly Val Ala Pro Pro Val Gln Val Pro His Gln Leu Pro Pro
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Asp Glu Glu Ser Arg Asp Ala Trp Pro Ser Thr Cys Ala Ala
 305 310 315

<210> 25
 <211> 674
 <212> DNA
 <213> Glycine max

<220>
 <221> unsure
 <222> (527)

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 <221> unsure
 <222> (561)

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<220>
 <221> unsure
 <222> (643)

<400> 25
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 cttaccacca tcaaaaatcc cttttggaca ccctatactg ctccgaagag cattggatag 180
 gggaagggtga atttgaccaa gcagaggagg agtacggtaa cagtaatagc aatagtagca 240
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 cttgctgtct ccaaagcaac cctgccttgg aggggtgctcg catagaagcc gtggagtggg 420
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 ggggtcgctg ccgtcgcttg nctctccctc gctgccaag tgggcgagac acacgttccc 600
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<210> 26
 <211> 186
 <212> PRT
 <213> Glycine max

<220>
 <221> UNSURE
 <222> (137)

<220>
 <221> UNSURE
 <222> (149)

<220>
 <221> UNSURE
 <222> (175)..(176)

<400> 26
 Met Ala Tyr His His Gln Lys Ser Leu Leu Asp Thr Leu Tyr Cys Ser
 1 5 10 15

Glu Glu His Trp Ile Gly Glu Gly Glu Phe Asp Gln Ala Glu Glu Glu
 20 25 30

Tyr Gly Asn Ser Asn Ser Asn Ser Ser Ser Thr Leu Val Asn Asn Ser
 35 40 45
 Pro Glu Ser Ser Pro His Leu Leu Leu Glu Ser Asp Met Phe Trp Asp
 50 55 60
 Glu Gln Glu Leu Ala Ser Leu Leu Glu Lys Glu Gln His Asn Pro Leu
 65 70 75 80
 Ser Thr Cys Cys Leu Gln Ser Asn Pro Ala Leu Glu Gly Ala Arg Ile
 85 90 95
 Glu Ala Val Glu Trp Ile Leu Lys Val Asn Ala His Tyr Ser Phe Ser
 100 105 110
 Ala Leu Thr Ala Val Leu Ala Val Asn Tyr Phe Asp Arg Phe Leu Phe
 115 120 125
 Ser Phe Arg Phe Gln Asn Asp Ile Xaa Pro Trp Met Thr Arg Gly Arg
 130 135 140
 Cys Arg Arg Leu Xaa Leu Pro Arg Cys Gln Ser Gly Arg Asp Thr Arg
 145 150 155 160

Ser Leu Ser Tyr Leu Thr Leu Gln Gln Ser Gly Arg Arg Ser Xaa Xaa
 165 170 175

Phe Val Pro Ser Gln Arg Arg Leu Lys Lys
 180 185

<210> 27
 <211> 554
 <212> DNA
 <213> Glycine max

<400> 27
 ctccctttca cttttcttca tagcctacca cttttctgct ttcattctact ctcaacttctc 60
 ttcacacact gagacacaca gagagagaaa aataaagggt gtgatgggtg tcttactgag 120
 tgttttcttt ttataatgaa caaagaactg cacaccctct tcttcaccga agaagaagat 180
 ggcaattcag caccacaatg accaactaga gcataatgaa aatgtotcat ctgtccttga 240
 tgccctttac tgtgacgaag gaaagtggga agaggaagag gaggagaaag aagaagaaga 300
 agatgaagggt gaaaatgaaa gtgaagtgaac aacaaacact gcaacttgct ttttcctct 360
 gctcttggtg gagcaagact tgttctggga agatgaggaa ctaaactcta tcttttccaa 420
 agagaagggt caacatgaag aagcctatgg tataacaatc tgaacagtga tgtgtataac 480
 aacaacaaca atactagtat ataatgtgat ttggctcttg ctcttcagct cgtcggagcg 540
 tgatgatgct gaat 554

<210> 28
 <211> 94
 <212> PRT
 <213> Glycine max

<400> 28
 Met Ala Ile Gln His His Asn Asp Gln Leu Glu His Asn Glu Asn Val
 1 5 10 15
 Ser Ser Val Leu Asp Ala Leu Tyr Cys Asp Glu Gly Lys Trp Glu Glu
 20 25 30
 Glu Glu Glu Glu Lys Glu Glu Glu Glu Asp Glu Gly Glu Asn Glu Ser
 35 40 45
 Glu Val Thr Thr Asn Thr Ala Thr Cys Leu Phe Pro Leu Leu Leu Leu
 50 55 60

Glu Gln Asp Leu Phe Trp Glu Asp Glu Glu Leu Asn Ser Ile Phe Ser
 65 70 75 80
 Lys Glu Lys Val Gln His Glu Glu Ala Tyr Gly Ile Thr Ile
 85 90
 <210> 29
 <211> 372
 <212> PRT
 <213> Catharanthus roseus
 <400> 29
 Met Ala Asp Lys Glu Asn Cys Ile Arg Val Thr Arg Leu Ala Lys Lys
 1 5 10 15
 Arg Ala Val Glu Ala Met Ala Ala Ser Glu Gln Gln Arg Pro Ser Lys
 20 25 30
 Lys Arg Val Val Leu Gly Glu Leu Lys Asn Leu Ser Ser Asn Ile Ser
 35 40 45
 Ser Ile Gln Thr Tyr Asp Phe Ser Ser Gly Pro Gln Lys Gln Gln Lys
 50 55 60
 Asn Lys Asn Lys Arg Lys Ala Lys Glu Ser Leu Gly Phe Glu Val Lys
 65 70 75 80
 Glu Lys Lys Val Glu Glu Ala Gly Ile Asp Val Phe Ser Gln Ser Asp
 85 90 95
 Asp Pro Gln Met Cys Gly Ala Tyr Val Ser Asp Ile Tyr Glu Tyr Leu
 100 105 110
 His Lys Met Glu Met Glu Thr Lys Arg Arg Pro Leu Pro Asp Tyr Leu
 115 120 125
 Asp Lys Val Gln Lys Asp Val Thr Ala Asn Met Arg Gly Val Leu Ile
 130 135 140
 Asp Trp Leu Val Glu Val Ala Glu Glu Tyr Lys Leu Leu Pro Asp Thr
 145 150 155 160
 Leu Tyr Leu Thr Val Ser Tyr Ile Asp Arg Phe Leu Ser Met Asn Ala
 165 170 175
 Leu Ser Arg Gln Lys Leu Gln Leu Leu Gly Val Ser Ser Met Leu Ile
 180 185 190
 Ala Ser Lys Tyr Glu Glu Ile Ser Pro Pro His Val Glu Asp Phe Cys
 195 200 205
 Tyr Ile Thr Asp Asn Thr Tyr Lys Lys Glu Glu Val Val Lys Met Glu
 210 215 220
 Ala Asp Val Leu Lys Phe Leu Lys Phe Glu Met Gly Asn Pro Thr Ile
 225 230 235 240
 Lys Thr Phe Leu Arg Arg Leu Thr Arg Val Val Gln Asp Gly Asp Lys
 245 250 255
 Asn Pro Asn Leu Gln Phe Glu Phe Leu Gly Tyr Tyr Leu Ala Glu Leu
 260 265 270
 Ser Leu Leu Asp Tyr Gly Cys Val Lys Phe Leu Pro Ser Leu Ile Ala
 275 280 285

Ser Ser Val Ile Phe Leu Ser Arg Phe Thr Leu Gln Pro Lys Val His
 290 295 300
 Pro Trp Asn Ser Leu Leu Gln His Asn Ser Gly Tyr Lys Pro Ala Asp
 305 310 315 320
 Leu Lys Glu Cys Val Leu Ile Ile His Asp Leu Gln Leu Ser Lys Arg
 325 330 335
 Gly Ser Ser Leu Val Ala Val Arg Asp Lys Tyr Lys Gln His Lys Phe
 340 345 350
 Lys Cys Val Ser Thr Leu Thr Ala Pro Pro Ser Ile Pro Asp Glu Phe
 355 360 365
 Phe Glu Asp Ile
 370

<210> 30
 <211> 335
 <212> PRT
 <213> Arabidopsis thaliana

<400> 30
 Met Arg Ser Tyr Arg Phe Ser Asp Tyr Leu His Met Ser Val Ser Phe
 1 5 10 15
 Ser Asn Asp Met Asp Leu Phe Cys Gly Glu Asp Ser Gly Val Phe Ser
 20 25 30
 Gly Glu Ser Thr Val Asp Phe Ser Ser Ser Glu Val Asp Ser Trp Pro
 35 40 45
 Gly Asp Ser Ile Ala Cys Phe Ile Glu Asp Glu Arg His Phe Val Pro
 50 55 60
 Gly His Asp Tyr Leu Ser Arg Phe Gln Thr Arg Ser Leu Asp Ala Ser
 65 70 75 80
 Ala Arg Glu Asp Ser Val Ala Trp Ile Leu Lys Val Gln Ala Tyr Tyr
 85 90 95
 Asn Phe Gln Pro Leu Thr Ala Tyr Leu Ala Val Asn Tyr Met Asp Arg
 100 105 110
 Phe Leu Tyr Ala Arg Arg Leu Pro Glu Thr Ser Gly Trp Pro Met Gln
 115 120 125
 Leu Leu Ala Val Ala Cys Leu Ser Leu Ala Ala Lys Met Glu Glu Ile
 130 135 140
 Leu Val Pro Ser Leu Phe Asp Phe Gln Val Ala Gly Val Lys Tyr Leu
 145 150 155 160
 Phe Glu Ala Lys Thr Ile Lys Arg Met Glu Leu Leu Val Leu Ser Val
 165 170 175
 Leu Asp Trp Arg Leu Arg Ser Val Thr Pro Phe Asp Phe Ile Ser Phe
 180 185 190
 Phe Ala Tyr Lys Ile Asp Pro Ser Gly Thr Phe Leu Gly Phe Phe Ile
 195 200 205
 Ser His Ala Thr Glu Ile Ile Leu Ser Asn Ile Lys Glu Ala Ser Phe
 210 215 220

Leu Glu Tyr Trp Pro Ser Ser Ile Ala Ala Ala Ala Ile Leu Cys Val
 225 230 235 240
 Ala Asn Glu Leu Pro Ser Leu Ser Ser Val Val Asn Pro His Glu Ser
 245 250 255
 Pro Glu Thr Trp Cys Asp Gly Leu Ser Lys Glu Lys Ile Val Arg Cys
 260 265 270
 Tyr Arg Leu Met Lys Ala Met Ala Ile Glu Asn Asn Arg Leu Asn Thr
 275 280 285
 Pro Lys Val Ile Ala Lys Leu Arg Val Ser Val Arg Ala Ser Ser Thr
 290 295 300
 Leu Thr Arg Pro Ser Asp Glu Ser Ser Ser Pro Cys Lys Arg Arg Lys
 305 310 315 320
 Leu Ser Gly Tyr Ser Trp Val Gly Asp Glu Thr Ser Thr Ser Asn
 325 330 335

<210> 31
 <211> 354
 <212> PRT
 <213> Nicotiana tabacum

<400> 31
 Met Ala Ala Asp Asn Ile Tyr Asp Phe Val Ala Ser Asn Leu Leu Cys
 1 5 10 15
 Thr Glu Thr Lys Ser Leu Cys Phe Asp Asp Val Asp Ser Leu Thr Ile
 20 25 30
 Ser Gln Gln Asn Ile Glu Thr Lys Ser Lys Asp Leu Ser Phe Asn Asn
 35 40 45
 Gly Ile Arg Ser Glu Pro Leu Ile Asp Leu Pro Ser Leu Ser Glu Glu
 50 55 60
 Cys Leu Ser Phe Met Val Gln Arg Glu Met Glu Phe Leu Pro Lys Asp
 65 70 75 80
 Asp Tyr Val Glu Arg Leu Arg Ser Gly Asp Leu Asp Leu Ser Val Arg
 85 90 95
 Lys Glu Ala Leu Asp Trp Ile Leu Lys Ala His Met His Tyr Gly Phe
 100 105 110
 Gly Glu Leu Ser Phe Cys Leu Ser Ile Asn Tyr Leu Asp Arg Phe Leu
 115 120 125
 Ser Leu Tyr Glu Leu Pro Arg Ser Lys Thr Trp Thr Val Gln Leu Leu
 130 135 140
 Ala Val Ala Cys Leu Ser Leu Ala Ala Lys Met Glu Glu Ile Asn Val
 145 150 155 160
 Pro Leu Thr Val Asp Leu Gln Val Gly Asp Pro Lys Phe Val Phe Glu
 165 170 175
 Gly Lys Thr Ile Gln Arg Met Glu Leu Leu Val Leu Ser Thr Leu Lys
 180 185 190
 Trp Arg Met Gln Ala Tyr Thr Pro Tyr Thr Phe Ile Asp Tyr Phe Met
 195 200 205

Arg Lys Met Asn Gly Asp Gln Ile Pro Ser Arg Pro Leu Ile Ser Gly
 210 215 220
 Ser Met Gln Leu Ile Leu Ser Ile Ile Arg Ser Ile Asp Phe Leu Glu
 225 230 235 240
 Phe Arg Ser Ser Glu Ile Ala Ala Ser Val Ala Met Ser Val Ser Gly
 245 250 255
 Glu Ile Gln Ala Lys Asp Ile Asp Lys Ala Met Pro Cys Phe Phe Ile
 260 265 270
 His Leu Asp Lys Gly Arg Val Gln Lys Cys Val Glu Leu Ile Gln Asp
 275 280 285
 Leu Thr Thr Ala Thr Ile Thr Thr Ala Ala Ala Ser Leu Val Pro
 290 295 300
 Gln Ser Pro Ile Gly Val Leu Glu Ala Ala Ala Cys Leu Ser Tyr Lys
 305 310 315 320
 Ser Gly Asp Glu Arg Thr Val Gly Ser Cys Thr Thr Ser Ser His Thr
 325 330 335

Lys Arg Arg Lys Leu Asp Thr Ser Ser Leu Glu His Gly Thr Ser Glu
 340 345 350

Lys Leu

<210> 32
 <211> 373
 <212> PRT
 <213> Nicotiana tabacum

<400> 32
 Met Ala Ile Glu His Asn Glu Gln Gln Glu Leu Ser Gln Ser Phe Leu
 1 5 10 15
 Leu Asp Ala Leu Tyr Cys Glu Glu Glu Glu Glu Lys Trp Gly Asp Leu
 20 25 30
 Val Asp Asp Glu Thr Ile Ile Thr Pro Leu Ser Ser Glu Val Thr Thr
 35 40 45
 Thr Thr Thr Thr Thr Thr Lys Pro Asn Ser Leu Leu Pro Leu Leu Leu
 50 55 60
 Leu Glu Gln Asp Leu Phe Trp Glu Asp Glu Glu Leu Leu Ser Leu Phe
 65 70 75 80
 Ser Lys Glu Lys Glu Thr His Cys Trp Phe Asn Ser Phe Gln Asp Asp
 85 90 95
 Ser Leu Leu Cys Ser Ala Arg Val Asp Ser Val Glu Trp Ile Leu Lys
 100 105 110
 Val Asn Gly Tyr Tyr Gly Phe Ser Ala Leu Thr Ala Val Leu Ala Ile
 115 120 125
 Asn Tyr Phe Asp Arg Phe Leu Thr Ser Leu His Tyr Gln Lys Asp Lys
 130 135 140
 Pro Trp Met Ile Gln Leu Ala Ala Val Thr Cys Leu Ser Leu Ala Ala
 145 150 155 160

Lys Val Glu Glu Thr Gln Val Pro Leu Leu Leu Asp Phe Gln Val Glu
 165 170 175
 Asp Ala Lys Tyr Val Phe Glu Ala Lys Thr Ile Gln Arg Met Glu Leu
 180 185 190
 Leu Val Leu Ser Ser Leu Lys Trp Arg Met Asn Pro Val Thr Pro Leu
 195 200 205
 Ser Phe Leu Asp His Ile Ile Arg Arg Leu Gly Leu Arg Asn Asn Ile
 210 215 220
 His Trp Glu Phe Leu Arg Arg Cys Glu Asn Leu Leu Leu Ser Ile Met
 225 230 235 240
 Ala Asp Cys Arg Phe Val Arg Tyr Met Pro Ser Val Leu Ala Thr Ala
 245 250 255
 Ile Met Leu His Val Ile His Gln Val Glu Pro Cys Asn Ser Val Asp
 260 265 270
 Tyr Gln Asn Gln Leu Leu Gly Val Leu Lys Ile Asn Lys Glu Lys Val
 275 280 285
 Asn Asn Cys Phe Glu Leu Ile Ser Glu Val Cys Ser Lys Pro Ile Ser
 290 295 300
 His Lys Arg Lys Tyr Glu Asn Pro Ser His Ser Pro Ser Gly Val Ile
 305 310 315 320
 Asp Pro Ile Tyr Ser Ser Glu Ser Ser Asn Asp Ser Trp Asp Leu Glu
 325 330 335
 Ser Thr Ser Ser Tyr Phe Pro Val Phe Lys Lys Ser Arg Val Gln Glu
 340 345 350
 Gln Gln Met Lys Leu Ala Ser Ser Ile Ser Arg Val Phe Val Glu Ala
 355 360 365
 Val Gly Ser Pro His
 370